FINAL REPORT

19960351

SCREENING OF HERBICIDES FOR WEED MANAGEMENT IN BUSH FRUIT ORCHARDS

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AFIF Project 96-351 (250603)

Final Report

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A. Introduction

The main crop in Saskatchewan bush fruit orchards is saskatoons. Recently, there is increased interest in choke cherry and sea-buckthorn and to a lesser extent high bush cranberry. Establishing and maintaining these orchards is a challenge, with one of the greatest challenges being weed management. From the time the site is selected through to the time the orchard is in full production, weeds of all types can threaten the success of the venture. Currently, the list of registered herbicides available to manage these weeds is limited. Manual weed control is temporary and significantly drains the energy and resources of the orchardist. Of the herbicides available for preemergence weed control, one which is particularly effective is also very expensive, putting a financial strain on new orchardists who may well have limited resources. There are some very competitive perennial weeds such as Canada thistle and quack grass for which there are no herbicide options currently registered for in-crop control.

Based on these concerns, emphasis was placed on testing herbicides to control Canada thistle and quack grass in-crop, and on preemergence herbicides capable of providing effective weed control at a lower cost than the current best treatment. If registered, these treatments will provide orchardists with valuable weed control options and assist in the development of the bush fruit industry. Herbicides evaluated in the project were: Simazine 80W (Simazine), Poast Ultra (Sethoxydim), Assure II (Quizalofop-ethyl), Gallery (Isoxaben), Linuron 480 (Linuron), Casoron (Dichlobenil) and Lontrel (Clopyralid).

The objective of the project was to gather data in support of submissions for User Requested Minor Use Label Expansion (URMULE) of herbicide treatments for use in bush fruit orchards.

B. Technical Report

The technical report for project AFIF 250603 has been compiled in four progress reports with background, objectives, activities and results found in each report. Copies of progress reports can be found in **Tabs 1, 2, 3 and 4.** Residue analysis for herbicides can be found in **Tab 5.** User Requested Minor Use Label Expansion (URMULE) were submitted are listed in Table 1. Complete URMULE submissions and formal responses received are located in **Tab 6.**

Table 1: Pesticide and proposed crop use for URMULE proposals

Pesticide	Proposed Use
Simazine 80W (Simazine)	saskatoon, choke cherry, high bush cranberry, sea buckthorn orchards
Poast Ultra (Sethoxydim)	choke cherry orchards
Assure II (Quizalofop-ethyl)	saskatoon, choke cherry, high bush cranberry, sea buckthorn orchards
Gallery (Isoxaben)	saskatoon, choke cherry, sea buckthorn orchards
Linuron 480 (Linuron)	choke cherry, high bush cranberry, sea buckthorn orchards
Casoron (Dichlobenil)	choke cherry orchards
Lontrel (Clopyralid)	saskatoon, choke cherry, high bush cranberry, buffaloberry orchards

The following is a summary of results for each of the herbicides evaluated in the project.

Gallery (isoxaben) is an effective preemergence herbicide with good activity on several broadleaf weed species and some annual grass species. Saskatoon, choke cherry and sea-buckthorn have all demonstrated good tolerance to this herbicide. Residues were detected in one of the saskatoon samples collected. URMULEs were submitted for Gallery use on saskatoon choke cherry and sea buckthorn. The Pest Management Regulatory Agency response suggested that because Gallery is not registered on any food products in Canada, full residue chemistry is required. This means that a herbicide be tested for residues in crops from three different crop groups; to date this herbicide has only been tested on bush fruit crops. Estimated cost for this process is $60-80,000 over a two to three period. Consequently, it is recommended that future work with Gallery should be directed towards registering this product for use during the years of orchard establishment rather than during years of fruit production.

Lontrel (clopyralid) continues to provide very good control of Canada thistle and perennial sow-thistle in our AFIF trials. Choke cherry, buffaloberry and highbush cranberry have exhibited acceptable tolerance to Lontrel as have most varieties of saskatoon. One exception is the saskatoon variety 'Thiessen' which has displayed some sensitivity. Sea- buckthorn is very sensitive to Lontrel application resulting in it being excluded from further testing. URMULEs were submitted for Lontrel use on saskatoon and highbush cranberry. The Pest Management Regulatory Agency has requested that a 2X rate be tested for all crops for which a registration has been requested.

Assure II (quizalofop ehtyl) has been well tolerated by all of the bush fruit species tested. There was one exception where choke cherry exhibited leaf burn as a result of Assure application at a 2X rate. This herbicide provides control of annual grasses and volunteer cereals and holds the potential to provide selective control of quack grass within orchards and tree plantings. URMULEs were submitted to Pest Management Regulatory Agency for Assure II use on saskatoon, choke cherry, sea buckthorn and highbush cranberry. No response has been received from the Pest Management Regulatory Agency.

Poast Ultra (sethoxydim) is registered for use in plantings of several tree species including saskatoon, buffaloberry and sea-buckthorn. It is registered for the control of barnyard grass, green foxtail, yellow foxtail, Persian darnel, proso millet, witch grass, wild oats, volunteer cereals and for the suppression of quack grass and foxtail barley. However our experience has shown that in situations where quack grass cannot be tilled, to allow for treatment of regrowth, control or suppression of this species is inadequate. In order to have choke cherry added to the label, Pest Management Regulatory Agency has requested that a 2X rate be tested in addition to the recommended rate. This additional testing has been conducted and the data submitted. The Pest Management Regulatory Agency has granted URMULE for Poast Ultra for weed control on orchards (non-fruit-bearing) of choke cherry.

Simazine (simazine) is a preemergence herbicide which provides residual control of many germinating broadleaf weeds and grasses. It was tested in plantings of saskatoon, choke cherry, sea-buckthorn and highbush cranberry of fruit-bearing age. All of the tree species tolerated simazine application except choke cherry which exhibited chlorosis at one test location. Laboratory analysis of saskatoon, choke cherry and sea-buckthorn fruit did not reveal any simazine residues at a 0.05 ppm detection limit. Highbush cranberry did not yield sufficient fruit to have herbicide residue analysis conducted. URMULE were submitted for simazine use on choke cherry, sea buckthorn, saskatoon and high bush cranberry. No formal response was received from Pest Management Regulatory Agency, informal response was that further residue trials using spiked and unspiked controls would be required. This would require 20-30 samples per crop at an estimated cost of $250/sample.

Linuron (linuron) is a preemergence herbicide which also has contact activity. Linuron is effective for control of several broadleaf weeds, especially winter annuals. It does not provide control of annual grasses through preemergence application but does have postemergence activity. It was tested in plantings of choke cherry, sea-buckthorn and highbush cranberry of fruit-bearing age. All of the tree species tested tolerated linuron application. At a detection limit of 0.05 ppm, no linuron residues could be detected in choke cherry or sea-buckthorn fruit. Highbush cranberry did not yield sufficient fruit to allow for

residue analysis to be conducted. URMULE were submitted for linuron use on choke cherry, sea buckthorn and high bush cranberry. No formal response was received from Pest Management Regulatory Agency, informal response was that further residue trials using spiked and unspiked controls would be required. This would require 20-30 samples per crop at an estimated cost of $250/sample.

Casoron (dichlobenil) is a preemergence herbicide which has activity on a very broad spectrum of weed species (thirty-nine species are listed on the registration proposal that has been submitted). In this AFIF project it was tested for choke cherry trees of fruit-bearing age. The choke cherry demonstrated good tolerance to Casoron and there were no residues detected in the fruit at a minimum detection limit of 0.05 ppm. URMULE were submitted for Casoron use on choke cherry and sea buckthorn. No formal response was received from Pest Management Regulatory Agency, informal response was that further residue trials using spiked and unspiked controls would be required. This would require 20-30 samples per crop at an estimated cost of $250/sample.

C. Personnel

In 1997, Simon Klein was hired as a summer student to work on this AFIF project. . Jan Howden and Brett Tyson were hired as temporary casual help. Lyle Alspach provided technical assistance. Bruce Neill was project manager.

In 1998, Brett Tyson was hired as a summer student to work on this AFIF project. Jan Howden, Rose Geiss and Linda Knoll were hired as temporary casual help. Lyle Alspach provided technical assistance. Bruce Neill was project manager.

In 1999, Jodie Horvath (Jankoski) was hired as a summer student to work on this AFIF project. She worked under the supervision of Lyle Alspach, Weed Management / Soil Technician, at the PFRA Shelterbelt Centre. Lyle Alspach provided technical assistance. Bill Schroeder was project manager.

In 2000, Lyle Alspach, Weed Management / Soil Technician, assisted by Jack Simpson, Seasonal Laborer (Herbicides) are conducting the trials. Bill Schroeder is acting project manager.

D. Equipment

No equipment was purchased with AFIF funds. Equipment required for the project was provided as an in-kind contribution form the PFRA Shelterbelt Centre.

E. Project Photos

Project Photos Lists are in **TAB 7**. Slides are available upon request from AAFC-PFRA shelterbelt centre Slide Library

F. Innovation Fund Acknowledgement

AFIF was acknowledged during contact with cooperators and during presentations.

G. Public Information Materials

Information from the project was published in the AAFC-PFRA Shelterbelt Centre's Annual Technical Review

H. Information Sharing

Project reports were presented to the annual meeting of the Saskatchewan Fruit Growers Association in November, 1999. Information on the project was made available to participants at the PFRA Shelterbelt Centre field day held in July, 1999. Presentations have been made to members of the Saskatchewan Fruit Growers Association and to others within the Saskatchewan horticultural community, at workshops and seminars within the province.

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